

NASA TECH BRIEF

Manned Spacecraft Center



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Analog Table Look-Up Device Identifies Unknown Terrain

An analog table look-up device provides a probability map defining an unknown terrain in terms of known terrain inputs. The device consists of an analog transformation network and a flying spot scanner. Data (for example a multispectral video input) on known terrain classifications (bare soil, grass, pine forest, etc.) are used to prepare a scatter diagram of 2000 points. The variables describing the terrain are grouped in independent pairs, converted to voltage signals and displayed on an oscilloscope screen as coordinates in a two dimensional system. The scatter diagram is the resultant plot of these 2000 inputs.

The unknown terrain is analyzed using these same variables. The variables are grouped as before, converted to voltage signals and displayed on an oscilloscope over which a negative transparency of the scatter diagram has been placed. The oscilloscope beam is defocused to illuminate an area much larger than the area of the individual dots. The resulting intensity seen through the transparency is related to the number of dots in the area and consequently the probability that the unknown terrain is the same as the terrain classification defined by the transparency. A flying spot scanner exposes a film with an intensity proportional to the intensity seen on the oscilloscope screen. The film image is a map defining the probability that the unknown terrain is the known

input. If the scanner scans at the same rate that the unknown terrain was originally viewed, a one-to-one correlation between the probability map and the unknown terrain results.

This information should be of interest to manufacturers and users of remote sensing equipment. Since the analyzed terrain need not be limited to topographical or geographical features but may be an array of transistors or a sheet of metal, this innovation may have further application in automated quality control.

Note:

Requests for further information may be directed to:

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No patent action is contemplated by NASA.

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